

REMARKS:

Applicant respectfully requests reconsideration of this application and reconsideration of the Office Action dated July 30, 2004. Upon entry of this Amendment, claims 12 through 41 will remain pending in this application. The amendment effected to each of the independent claims 12, 27, 30 and 33 is identical and has been made as a clarifying amendment merely to emphasise the differences between the present invention and the cited prior art, as will be explained. Support for the amendment can be found, for example, at page 1, lines 18 – 21 (“the plates are oriented with respect to each other so that the pole pieces and recesses are axially aligned” and “the magnetic flux distributions thus created, divert ferromagnetic material in the fluid towards the regions defined by opposite pairs of pole pieces”) and page 4, lines 24 to 28 (“axially displaced pairs of pole pieces 11, 12 define radially extending collecting regions 14 in which ferromagnetic particles subject to the magnetic fields generated therein, can be retained”). The amendment is thus fully supported by the specification and original claims.

The amendment to claim 26 corrects an obvious typographical error pointed out by the Examiner in the last Office Action and is fully supported by the specification and original claims.

No new matter is incorporated by this Amendment.

New dependent claims 42 to 45 have been added to provide additional varied scope claim protection for this invention. No new matter is introduced with these amendments as well (e.g., the disclosure bridging pages 4 and 5 of the present application and the last paragraph on page 2). The appropriate new dependent claim fees are included herein as well.

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Applicant gratefully acknowledges Examiner's indication that claim 32 is allowed. Reconsideration of the rejections raised against the remaining claims is respectfully requested for the reasons set forth below.

The rejection of claims 12, 13, 15, 20, 22 through 24, 27 through 31 and 33 through 41 under 35 US C. §102(b) as being anticipated by Frei (US 2149764) is respectfully traversed by Applicant.

In particular, claim 12 specifically recites that "opposed said pole pieces on said first and second plates define regions . . . to which ferromagnetic material is attracted and retained". This is clearly not the case in Frei.

As stated in column 2, lines 10 through 14, Frei comprises "a sieve or strainer preferably composed of two layers 6 and 7 of foraminous material of different degrees of fineness". The screens 6 and 7 are formed of magnetizable material and are in contact with a series of baffle plates 8 also of magnetizable material, the baffle plates 8 being separated by means of cylindrical permanent magnets 9 (column 2, lines 21 through 29).

The operation of Frei is discussed in detail in the passage from column 1, line 55 to column 2, line 7. Specifically, that passage states that "the fluid is forced to flow by the multitude of edges and corners provided by the magnetized baffle plates, and the magnetic material in the fluid adheres to such edges and also to the wires of the screens 6 and 7 which are also magnetized by their engagement with the peripheries of the baffle plates" (underlining added).

It should therefore be observed that Frei specifically discloses that magnetizable material adheres to the edges and corners of the magnetized baffle plates and to the magnetized wire screens. In particular, and in contrast to the requirements of amended claim 1, in Frei, the opposed pole pieces on the first and

second plates do not define a plurality of collecting regions extending between opposed pole pieces to which ferromagnetic material is attracted and retained.

This distinction is emphasised in the description of the second embodiment of Frei which states on page 2, column 2, lines 11 through 15 that “In flowing through the meshes of the screens and past the multitudinous edges and corners of the baffle plates, the ferrous material in the fluid is extracted by the magnetized parts and the fluid thereby purified”.

The amendment offered to claim 1, namely to state that the opposed pole pieces on the first and second plates are positioned with respect to each other to define the plurality of collecting regions extending between opposed pole pieces to which ferromagnetic material is attracted and retained, emphasises this distinction still further.

It is clear from the aforementioned passages of Frei that the opposed pole pieces on the first and second plate do not define a plurality of collecting regions extending between the opposed pole pieces. Instead, the purpose of the baffle plates 8 is to magnetize the screens 6 and 7. The provision of “pole pieces” is incidental. Indeed, no specific reference is made to the “pole pieces” which are merely the material between the “plurality of serrations or notches 22 permitting fluid to flow through the interior of the filter unit 5”. It is perhaps noteworthy that Frei does not even assign a reference numeral to the “pole pieces” formed between adjacent notches or serrations 22.

Thus, the baffle plates of Frei are provided to magnetize the screens 6 and 7 and must necessarily be in contact with the screens. However, notches or serrations 22 are provided to allow fluid to flow through the filter unit. Therefore, the portions of the baffle plates 8 remaining between the notches or serrations 22 are merely

incidental and, as explained in the passages referred to above, do not define regions extending between the opposed portions to which ferromagnetic material is attracted and retained.

This is perhaps not surprising, since Frei and the present invention are intended to work in very different ways. In Frei, the filtering is achieved by passage of the contaminated fluid through the magnetized screens 6 and 7. Indeed, each of the ten independent claims of Frei specifically includes this feature. Moreover, in order for the fluid to pass out of the filter device 5, through the second port 4, it is absolutely essential for the fluid to pass radially outwardly through the screens 6 and 7 as seen by the flow representation arrow "a" in Figure 1.

In contrast, the present invention permits longitudinal fluid flow through the device at all times. By arranging the opposed pole pieces on the first and second plates such that they define a plurality of spaced-apart collecting regions extending between opposed pole pieces, fluid is allowed to pass freely through the passage means defined between opposed recesses on the first and second plates. However, as a result of the collecting regions extending between the opposed pole pieces, ferromagnetic material passing through the passage means with the fluid flow is extracted from the fluid flow and retained in the spaced-apart collecting regions.

Thus, in the present invention when ferromagnetic contaminants are extracted from the fluid flowing through the device, they do not interfere with the flow of fluid. In contrast, in Frei the magnetizable material collects on the edges and corners of the baffle plates 8 and on the magnetized screens 6 and 7. Thus, the contaminant material remains in the flow of fluid passing through the device.

Not only does this restrict the flow of fluid through the filter device, but since fluid passing through the device is continually passing over extracted material, there

is a very much increased risk that material extracted from the fluid flow will be dislodged and drawn back into the fluid flow, thereby recontaminating the fluid.

In the present invention, once ferromagnetic contaminants have been removed from the fluid flow, they do not obstruct the fluid flow. Therefore, they do not interfere with the flow of fluid through the device and there is minimal risk of extracted material being drawn back into the fluid flow since the fluid flow does not pass over the extracted material.

In Frei, there is no interaction between the pairs of plates since by doing so, it would degrade the magnetic field strength available to the surfaces to be magnetized. Thus, magnetic fields are localised to the individual plates (where there is no interaction between the fields of opposing plates rather than extended to a third dimension in the axial plane). As a result, particles would collect preferentially on the available larger expansion of surface on each plate and because the magnetic fields are only localised and are relatively weak, such particles would be difficult to retain and would thus be prone to being washed off in the cause of disturbance caused by fluid flow.

Indeed, it is probably also worth noting that the inclusion of the screen in Frei further prevents any magnetic interaction between the plates (even if they were close enough together to interact in the first place, which, it is submitted, they are obviously not) as it short-circuits the magnetic flux gradient and diffuses any useful flux into energising the screen.

In other words, the use of a screen such as that disclosed in Frei would eliminate the effects and advantages of the present invention, for the collection of magnetizable material in the defined spaced-apart collection regions. The incorporation of a screen such as that seen in Frei and the extension of the baffle

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plates out to energize the particle capturing flow through screen demonstrates a completely different arrangement of Frei as compared to the present invention having the capture regions defined above.

It is therefore respectfully submitted that the present invention as defined by amended claim 1 filed herewith is clearly both novel and non-obvious over and above the prior art.

Claims 30 and 33 have been amended in a manner analogous to that of claim 1 and the same considerations with regard to patentability over and above Frei applied to those claims as they do to claim 1.

It is also observed that claims 13 to 26 are dependent upon claim 12, claims 28 and 29 are dependent upon claim 27, claim 31 is dependent upon claim 30 and claims 34 to 41 are dependent upon claim 33. It is therefore believed that no further arguments in support of the patentability of those claims is necessary or desirable.

New claims 42-45 depend as well from independent claims submitted to be in immediate condition or allowance.

In view of the declaration and the above remarks, Applicant submits that this rejection is overcome, hence, reconsideration and withdrawal of the rejection is respectfully requested.

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Applicant respectfully submits that this Amendment and the above remarks obviate all of the outstanding rejections in this case, thereby placing the application in condition for immediate allowance. Allowance of this application is earnestly solicited.

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If any fees under 37 C.F.R. § 1.16 or 1.17 are due in connection with this filing that are not accounted for, please charge the fees to Deposit Account No. 02-4300, Order No. 033988.003.

Respectfully submitted,  
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